FEBRUARY, MDCCCLXII.

THE ZOOLOGIST:

A

POPULAR MONTHLY MAGAZINE

OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, MOLLUSKS,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

No. CCXXXIX.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

Price ONE SHILLING.

NOTICES OF NEW BOOKS.

'*The Romance of Natural History.*' By PHILIP HENRY GOSSE, F.R.S. Second Series. London: James Nisbet & Co., 21, Berners Street. 1861. 390 pp. letterpress: nine plates.

IT is very curious to observe what particular articles of faith individual naturalists adopt. The British Museum believes in meteoric stones, but rejects sea serpents; the 'Zoologist,' on the contrary, believes in sea serpents and thinks every meteoric stone a hoax; one man pooh-poohs the cow-sucking propensities of the hedgehog, but cherishes, as the apple of his eye, a belief that a toad can exist without any inconvenience for some ten thousand years in a block of granite; many a man has witnessed showers of fish, but thinks the showers of frogs altogether apocryphal; all sailor naturalists believe in mermaids, but all landsmen naturalists consider these tales the merest rubbish. It would be most interesting to study the phrenological development of each believer; to inquire why one man should believe in ghosts, another in meteoric iron: why he should call it lunar iron I can easily conceive, for, on the principle that love tinges every object with its own rosy hue, so the mind, impregnated with lunar influence, will impart a lunar character of every object on which it reflects. But why should a man believe in lunar iron and reject a mermaid? or believe in a mermaid and reject a sea serpent? or believe in a sea serpent and reject the immortality of toads? or believe in the immortality of toads and "pooh-pooh" the abundantly proven fact that vipers swallow and disgorge their interesting progeny at pleasure? Some bump of general credulity must be common to all such believers, but surely there should be a peculiar development of brain for each particular belief: a man must needs have a "capacious vaulted cranium" to invest a seal with the gigantic proportions of a sea serpent. Mr. Gosse is the only naturalist who believes in everything; he seems specially retained by the marvellous, and pleads its cause wherever he finds the least scrap of legendary lore that he can convert into a brief. He makes out a triumphant case for the showers of fishes (chap. 2); he leaves the traducers of mermaids as destitute of a leg to stand on as as the mermaids themselves (chap. 3); he shows that toads can endure hunger, thirst and suffocation for a few thousand years with perfect impunity (chap. 4); and what is still more strange, when accidentally exhumed, they exactly resemble their fellows of the present generation of toads: thus giving a severe, but we trust unintentional, blow to

Darwinianism. He revives and establishes the torpidity theory of swallows (chap. 5); defends the crested and wattled snake that crows like a cock (chap. 6); and adduces incontrovertible evidence that vipers swallow their little ones (chap. 7). Such a work may well be yclept the 'Romance of Natural History.' It bears about the same relation to the every-day natural history of our fields, as the Iliad of Homer to the despatches of the Duke of Wellington.

One result, however, is inevitable to those who read the 'Romance:' it is impossible to rise from the perusal without finding that the author has supplied abundant food for thought. Nothing is more easy than to avow a disbelief in whatever we cannot see, or feel, or do not possess; but it is most illogical to found a disbelief on the absence of such evidence. A parity of reasoning would rob us of history with its multitude of facts, and especially of those natural phenomena which have left no trace behind them, such, for instance, as comets, eclipses and earthquakes long, long, past, and of which we can obtain no information, except from the accounts written by actual eyewitnesses: in all instances the character of such witnesses must be our main guide in the reception or rejection of their evidence : thus if six men describe a mermaid, six men describe a sea serpent, and six men a chariot wheel they have dredged from the bottom of the Red Sea, we have no right to reject the first and second events, and accept the third, on the ground that it is rendered probable by a knowledge that Pharaoh and his host were overwhelmed by the waters at the very spot where the chariot wheel was found. The only question that need be answered is this—Is the narrator worthy of credence ? And should the result be affirmative I hesitate not to say that I would as readily believe in the sea serpent as in the chariot wheel. Never will I admit the right of the scientific to dictate to the unscientific what they shall see and what they shall believe; the measuring mind of the mere technical naturalist, like the locomotive engine, must keep to the direct line of rail,—it is upset by the slightest deviation to the right hand or the left. Not so the observer of Nature out of doors; to him the land, and sea, and air, are welcome to reveal all their wonders; he can gaze on a sea serpent or a mermaid without exclaiming, "Avaunt! stand aside because you have no place in my museum." I do not claim unhesitating belief for all that is marvellous, but I do ask the truthlover to sift evidence for his own satisfaction : the very attribute of marvellous is often conferred by ignorance alone.

It cannot, however, escape the notice of the cautious that many of the "marvellous" discoveries, especially in the instance of toads, are made by men who consider beer the natural produce of their narratives. This was the case in the celebrated Chesterfield quarries, as recorded in the 'Zoologist' by Mr. Plant; when that gentleman refused to advance a single pint, the tales of toads absolutely ceased, although he offered no less than two pounds sterling for a toad *in situ*. The frequent occurrence of cavities in nodules of flint, and the figure of those cavities, often suggest the idea that they have been occupied by an animal; and the heedless avidity of wondermongers has often induced a droughty quarry man who has cracked a hollow nodule of flint, to squeeze a toad into what he would feign have us believe its legitimate domicile; so true it is that demand creates supply. Then, again, as to meteoric iron: that there is a substance so called no one will dispute, and that this substance realises a price little inferior to gold is patent to every one; but exactly according to the fluctuation in credulity does the value of meteoric iron fluctuate also. Of late years the depreciation has caused an "awful sacrifice on the article," to use the language of dealers, the evidence of the extramundane nature of meteoric iron having been thoroughly examined and found very faulty. Both sides of every question should be patiently heard, and any object that will not bear the test of inquiry must be abandoned by the truth-seeker, whether it be a sea serpent, a toad, or a thunderbolt.

After thus generalizing on the romantic in Natural History, we turn to the 'Romance' itself, and at once pronounce it the most amusing, though the least original, of all Mr. Gosse's labours. To myself it is peculiarly pleasing to observe how extensively the 'Zoologist' has been quoted, and how admirably the quotations read. The value of this Journal as a repertory of Natural-History facts has long been known, but it is to such volumes as those lately published by Mr. Atkinson and Mr. Gosse that I am indebted for showing how greatly the cause of Natural History has been served by the accumulation and preservation of narratives which would otherwise have been lost to the historian of our Science.

I feel considerable difficulty in selecting from an acknowledged compilation passages which will be new to my readers, but those I have selected, if not possessed of the engaging quality of novelty, cannot fail to be found interesting. It only remains for me to say that it is impossible to place in the hands of the young, the imaginative and the adventurous, a work more likely to lead them on to discoveries for which Science may hereafter acknowledge how greatly it is indebted to them.

Extinction of Didunculus strigirostris and Nestor productus.—"Species are dying out in our own day. I have already cited the interesting case of the moho, that fine Gallinule of New Zealand, of which a specimen—probably the last of his race—was obtained by Mr. Walter Mantell, and that of the káureke, the badger-like quadruped of the same islands, which was formerly domesticated by the Maoris, but which now cannot be found.

"The Samoa Isles, in the Pacific, recently possessed a large and handsome kind of pigeon, of richly coloured plumage, which the natives call Manu-mea, but to which modern naturalists have given the name of Didunculus strigirostris. It was, both by structure and habit, essentially a ground pigeon, but not so exclusively but that it fed, and roosted too, according to Lieutenant Walpole, among the branches of tall trees. Mr. T. Peale, the naturalist of the U. S. Exploring Expedition, who first described it, informs us that, according to the tradition of the natives, it once abounded; but some years ago these persons, like more civilized folks, had a strong desire to make pets of cats, and found, by means of whale-ships, opportunities of procuring a supply; but the consequence of the introduction of 'pussy'—for under this familiar old-country title were the exotic tabbies introduced—was the rapid dimunition of the manu-mea. Pussy did not fancy yams and taro,—the vegetable diet on which the natives regaled,—and took to the woods and mountains to search for something better. There she met with the feeble-winged Didunculus scratching the soft earth for seeds, and with a purr and a mew soon scraped acquaintance with the stranger. Pussy declared she loved him well, and so she did—too well, in fact; she felt 'as if she could eat him up'—and did. The news soon spread among the tabbies that there were sweet birds in the woods, and the result is the almost total disappearance of poor manu-mea. Like the dodo, it has ceased to be, but at the hand of a more ignominious foe. The Samoan may truly say to his former pet, 'Cecidisti, O manu-mea, non manu meâ, sed ungue felino.' So rare had the bird become, that during the stay of the Expedition only three specimens could be procured, and of these, two were lost by shipwreck. I do not know whether another has been met with since. Probably they are all gone; for that was twenty years ago.

"When Norfolk Island—that tiny spot on the Southern Ocean, since so stained with human crime and misery—was first discovered, its tall and teeming forests were tenanted by a remarkable parrot with a very long and slender hooked beak, which lived upon the honey of flowers. It was named Nestor productus. When Mr. Gould visited Australia, in his researches into the Ornithology of those antipodeal regions, he found the Nestor parrot absolutely limited to Philip Island, a tiny satellite of Norfolk Island, whose whole circumference is not more than five miles in extent. The war of extermination had been so successful in the larger island that, with the exception of a few specimens preserved in cages, not one was believed to survive. Since then its last retreat has been harried, and Mr. J. H. Gurney has published in the 'Zoologist' (Zool. 4298) the dirge of the last of the Nestors."—P. 79.

This subject of the gradual but certain extinction of species, one after another, is not only of great interest, but is of far wider extent than naturalists generally suppose; the genera Notornis, Nestor, Strigops, Apteryx, Casuarius and many others are as certainly following in the wake of Deinornis, Palapteryx and Didus, as these have followed the pre-historic inhabitants of this earth's surface.

Spontaneous production of Fish.—"It is a curious fact that the pools, reservoirs and tanks in India and Ceylon are well provided with fish of various species, though the water twice every year is perfectly evaporated, and the mud at the bottom becomes converted into dust, or takes the condition of baked clay, gaping with wide and deep clefts, in which not the slightest sign of moisture can be detected. This is the case with temporary hollows in the soil, which have no connexion with running streams or permanent waters, from which they might be supposed to receive a fresh stock of fish. Two modes of accounting for this strange phenomenon have obtained currency. The one is that received by those Europeans who are content with any solution of a difficulty without too closely testing it; viz. that the fishes fall with the rain from the air. The actual occurrence of such showers rests, as we have just seen, on good evidence; but admitting the fact, it must be a rare phenomenon, whereas the presence of fish in new-made pools is universal. Again, if the rains brought them in such abundance as to stock all the pools, an equal number would fall on the dry ground, which is not pretended to be the case. The other accepted solution is that which has received the sanction of Mr. Yarrell, who observes, 'The impregnated ova of the fish of one rainy season are left unhatched in the mud through the dry season, and from their low state of organization *as ova*, the vitality is preserved till the occurrence and contact of the rain, and the oxygen, of the next wet season, when vivification takes place from their joint influence. This may be fully allowed, yet it does not meet the exigencies of the case. Sir Emerson Tennant and others have shown that it is not young fishes, just escaped from the egg, which appear in the newly-formed pools, but full-grown fishes, fit for the market; a fact well known to the Cingalese fishermen, who resort to the hollows as soon as the monsoon has brought rain; and they invariably take, in these pools, which a day or two before were as dry as dust, plenty of fishes fully grown, a foot or eighteen inches long or longer. Neither of these hypotheses, then, will account for the fact; and we must admit that the fishes of these regions have the instinct to burrow down into the solid mud at the bottom, on the approach of the dry season, and the power of retaining life, doubtless in a torpid condition, until the return of the periodic rains, as Theophrastus long ago observed."—P. 118.

And I may add that this is abundantly proved by the now thoroughly ascertained habits of that "odd fish" the Lepidosiren.

EDWARD NEWMAN.

'*The Entomologist's Annual' for* 1862. London: John Van Voorst, Paternoster Row. 160 pp., demy 12mo; 1 coloured plate. Price 2*s*. 6*d*.

After the publication, in the expiring 'Intelligencer,' of Mr. Stainton's views on the subject of periodicals, I scarcely expected to have had the pleasure of once again beholding an 'Entomologist's Annual;' but here it is, and although the cover is as bilious-coloured as usual, I most heartily congratulate the editor in having wholly excluded that bilious writing which has so often served to set entomologists together by the ears. The volume before us contains the following papers:—

A Comparative List of the Fossil Insects of England and Bavaria. By Dr. Hagen.

Index to the new Coleoptera enumerated in the 'Entomologist's Annuals,' 1856—1861. By W. F. Kirby.

Notes on British Trichoptera, with Descriptions of new Species, &c. By Robert M'Lachlan.

Notes on Eupithecia Larvæ. By the Rev. H. Harpur Crewe, M.A.

A Chapter on Zygæna Minos. By the Editor.

New British Species of Lepidoptera in 1861. By the Editor.

Rare British Species of Lepidoptera captured in 1861.

Observations on British and Continental Tineina.

Answers to Enigmas: Enigmas still unanswered: New Enigmas for solution.

Natural History of the Tineina.

Notes on Hymenoptera observed during the past Season; Some Observations on Hymenopterous Parasites, and a Monograph of the Family Chrysididæ. By Frederick Smith.

On Hemiptera, commonly called Bugs. By John Scott.

New Works on Entomology.

Mr. M'Lachlan's paper is one of great interest, and does infinite credit to its author: it is written throughout with the greatest care, and introduces one species apparently new to Science, the

PHILOPOTAMUS SCOTICUS of M'Lachlan.

Female. Antennæ brown, annulated with yellowish; head clothed with golden yellow hairs; eyes black; thorax and abdomen black; legs pale ochreous, tibiæ fuscous, spurs fuscous beneath; anterior wings rich yellow, with numerous more or less confluent, irregularly formed, fuscous streaks and blotches; the first apical cell does not reach the anastomosis; posterior wings purplish fuscous, costa and inner margin narrowly edged with yellow; pterostigma and a spot at the margin in each apical cell also yellow. A single specimen is in the British Museum, taken at Rannoch, in Perthshire, by the late Mr. Foxcroft.

Mr. Crewe's descriptions of the larvæ of Eupitheciæ are already known to my readers, and I believe greatly valued by them: the describing of larvæ is a new feature in our science, or rather one that had almost become obliterated.

Mr. Stainton's chapter on Zygæna Minos is both useful and interesting, but he does not seem sufficiently at home with the German language, always to convey in English the exact meaning of the authors he translates. The following passages relating to the larvæ are very valuable:—

Larvæ of Zygæna Minos, var. *Heringi of Zeller, described by Professor Hering.* "The larva of the ordinary Zygæna Minos, which we find here almost exclusively on Pimpinella Saxifraga, ever occurs later with us than about the middle of May. The larva of the above-mentioned variety or species, which flies in the perfect state in August, when Z. Minos is long past, I had for several years sought in vain. I find them only on Thymus Serpyllum, on sandy places in fir woods, never in our fortification trenches, where Z. Minos is, in many years, quite common. This year I found a larva on the 21st of June, which died for want of care. But I made the following description : — The larva is dark citron-yellow ; at the end of each ring are two black spots, which consequently form a double row of spots, between which are numerous white hairs, placed on extremely fine blackish warts. Along the legs is placed, in the middle of each segment, a small black spiracle, over and under which are white hairs, as on the back."—P. 60.

Observations on the Larva of Zygæna Minos, by C. F. Freyer. — "When I gave my figure of Zygæna Minos, on plate 86, I had always found the larvæ yellow and no other colour. However, on the 25th of May, 1843, I chanced by accident to find, in a meadow near a wood, a number of the white larvæ of Zygæna Minos, which is very like Hübner's figure, and, at the very same place, amongst them some yellow larvæ. They ate very properly only Pimpinella, but they also bit other plants, such as thyme, &c. Of these larvæ, which when I found them were just full-grown, I collected considerably more than a hundred, amongst them from seventeen to twenty of the yellow ones, which were also rather larger. I immediately separated them, and kept the white larvæ and the yellow larvæ in separate cages. But unfortunately many, indeed most, of the larvæ were infested with Ichneumons or Gordii, so that in proportion to my stock of larvæ I obtained only a few perfect insects, which showed no further differences except the above mentioned characters. Only I may remark this, and I consider it of some importance, that the yellow larvæ almost all produced females, whereas the white larvæ furnished mostly males and very few females. Is the difference of colour a sexual character ? I may further observe that the yellow larvæ had a dark dorsal stripe, whereason the white or bluish white larvæ no dorsal stripe was perceptible. The cocoons of the yellow larvæ were silvery gray, some few cocoons were, however, pale yellow. The cocoons of the white larvæ were also much flatter, and not so vaulted as those of the yellow larvæ. * * * If we reflect on the difference in the colour and markings of the larvæ, it is of course very probable that if the differences do not indicate the sexes, two species may have been confounded, although it will be difficult to find out any good points of distinction in the perfect insects."—P. 59.

Mr. Stainton, with admirable fairness, leaves every writer to speak for himself, and leaves it a moot question whether in Ireland or on the Continent two species of Zygæna are confounded under the name of Minos.

Mr. Smith's paper on Hymenoptera possesses all the excellencies of that accomplished entomologist; the instances of parasitism which Mr. Smith has established from actual observation are extremely interesting, especially to an entomologist who thirty years ago associated these parasites under the name of cuckoo-bees.*

Epeolus variegatus,	parasitic on	Colletes Daviesana
Nomada varia,	„	Halictus rubicundus
„ furva	„	„ Morio
„ Solidaginis,	„	„ abdominalis
„ Jacobeæ,	„	Andrena fulvicrus
„ ruficornis,	„	„ nigro-ænea
„ lateralis,	„	„ longipes
„ baccata,	„	„ argentata
„ ochrostoma,	„	„ labialis
„ borealis,	„	„ Clarkella
„ armata,	„	„ Hattorfiana
„ germanica,	„	„ fulvescens
„ sexfasciata,	„	Eucera longicornis
Cœlioxys quadridentata	„	Megachile argentata
„ Vectis,	„	„ maritima
„ simplex,	„	„ Willughbiella
„ umbrina,	„	Saropoda bimaculata
Stelis aterrima,	„	Osmia aurulenta
„ phœoptera,	„	„ fulviventris
„ octomaculata,	„	„ leucomelana
Genus Melecta,	„	Genus Anthophora
Apathus rupestris,	„	Bombus lapidarius
„ campestris,	„	„ Hortorum
„ Barbatellus,	„	„ Pratorum
„ vestalis,	„	„ terrestris

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* "Apathites, cuckoo-bees. Larva hatched from an egg deposited by its parent in the nests of all the preceding Apina at the time when their own eggs are laid: when it hatches, being stronger and larger than the rightful possessor of the cell, it consumes the food provided for its companion, and starves it to death; and in those instances in which fresh supplies of food are daily provided it continues to receive and appropriate them as its own. Pupa changes in the same situation, in a silken cocoon spun by the larva. Imago has no apparatus either on the body or legs for collecting honey; in other respects it resembles in structure each of the orders of Apina before described; it enters their nest with perfect familiarity, and seems to be quite unsuspected of intrusion; it collects no pollen or honey, never builds a nest of any kind or takes any care of its young, but spends its time among flowers, or hovering about sand-banks in which other bees have fixed their habitations. Apathus, Cœlioxys, Melecta, Stelis, Epeolus, Nomada, Hylæus?"—*Ent. Mag.* ii. 404.

It is not a little remarkable that out of the seven genera of bees *supposed* by myself to be parasitic in 1834, Mr. Smith should have *proved* six to be parasitic before 1862; his labours seem to have wonderfully established the conclusions I had drawn many years ago: the seventh genus, Hylæus, since called Prosopis, Mr. Smith considers to have been proved non-parasitic both by Mr. Thwaites and Mr. Sidney Saunders, and I most cheerfully bow to authorities so deservedly esteemed. I always entertained a doubt on the subject, and expressed that doubt by a note of interrogation.

In Mr. Stainton's New British Species of Lepidoptera he makes no mention of my Ephyra decoraria, supposed by Mr. Doubleday to be a Nemoria. Whence this reticence I cannot imagine. I am glad to see Mr. Stainton quoting with approbation Mr. Doubleday's "truly philosophic note,"—"Whether the Irish Zygæna is anything more than a local variety of Minos time may perhaps prove." The spirit of this "truly philosophic note" might be advantageously extended to the whole of those minute Lepidoptera to which Mr. Stainton has paid such undivided attention.

On the whole the 'Entomologist's Annual' for 1862 is superior to either of its predecessors; and I shall regret to read any announcement of its discontinuance, on the ground recently advanced, in the now defunct 'Intelligencer,' against periodical literature in matters of Science.

Edward Newman.

'*The Natural History of the Tineina.*' Vol. VI., containing Depressaria, Part I. By H. T. Stainton, assisted by Professor Zeller and J. W. Douglas. London: John Van Voorst, Paternoster Row. 280 pp. letter-press; eight coloured plates.

This volume not merely equals, it exceeds, those which have preceded it in the careful accuracy of its letter-press and the extreme beauty and fidelity of its plates. There is an exquisite delicacy of drawing in the representations both of the perfect insects and larvæ, and the difference exhibited between the larvæ of closely allied species will do more than any descriptions of the perfect insects to prove them really distinct.

Of some of Mr. Stainton's labours I am unable to see the merit, and therefore, in truthfulness, have abstained from all praise; but in his 'Natural History of the Tineina' he is erecting a monument which will be the admiration of all entomologists, whether of the present or future generations, whose approbation is worthy of being earned.

EDWARD NEWMAN.

'*Tabular View of the Primary Divisions of the Animal Kingdom: intended to serve as an Ontline of an Elementary Course of Recent Zoology* (*Cainozoology*), *or the Natural History of Existing Animals.*' By ROBERT E. GRANT, M.D. London: Walton and Maberly. 1861.

The Professor of Comparative Anatomy and Zoology in University College, London, in sending a copy of this little work to the editor of the 'Zoologist,' seems to challenge that fair and conscientious criticism which it is the custom of the said editor to mete out with impartial pen to all who invite it. Taking this view of the subject I cannot in courtesy decline the task of reading and publicly noticing this very faint outline of an elementary course of lectures delivered in University College by a Professor of thirty-four years standing, Dr. Grant having received his appointment in 1827.

In perusing these pages the first thing that attracts my notice is their inflated style; the second the substitution of new names, with Grant as the authority, for old names with Cuvier, &c., as the authority; the third is the apparent inattention to, I scarcely presume to say ignorance of, the discoveries and improvements of the last quarter of a century; and the fourth is the apparently crude and unsatisfactory manner in which groups are either associated or divided. I proceed to give illustrations.

First, of the inflated style. "With one fell swoop of the wand of truth, you have now scattered to the winds the pestilential vapours accumulated by species-mongers over every step of this ever-varying, ever-charming part of Nature's works; and your next movement will dispel the remaining clouds of mystical supernatural typical intrusions which still hang on the horizon of the sublime prospect, now opening to the view, of the natural animalization of the orbs of space by the same simple laws which govern the physical and chemical phenomena with such wondrous harmony throughout the rest of the material universe." This rhodomontade is addressed to Mr. Darwin, and doubtless has some occult reference to that great naturalist's work on the 'Origin of Species,' but its meaning is entirely obscured by the multiplicity of inappropriate words.

Secondly, of the substitution of new for old names. In the bats the words Pteropodida, *Grant*, Noctilionida, *Grant*, Vespertilionida, *Grant*, Phyllóstomida, *Grant*, Rhinolophida, *Grant*, are employed for groups long since characterised and familiarly known under prior names: the Marsupialia or Marsupiata, described by numberless authors under these names, are now the Dimetroa, *Grant*. Lepidosiren constitutes the order Nematopteri, *Grant*. Similar instances occur in almost every page, and, what seems greatly to be regretted, the new names are rarely so appropriate, and never so pronounceable, as the old, and are therefore most unlikely ever to be adopted.

Thirdly, of inattention to modern discoveries and improvements. The Carnivora follow instead of precede the less perfectly formed Insectivora, and the rodents take precedence of the pachyderms. In birds no reference whatever is made to physiological characters.

Fourthly, of the unsatisfactory way in which groups are associated or divided. The genera Psophia and Gypogeranus, the raptorial Gypogeranus! form the new order Alectorides; the genera Grus and Chionis, the pigeon-like Chionis! are combined in order Grallatores; Columba stands as the type of Gallinæ; yet these are described as "large, heavy;" the woodpeckers stand at the head of the order Zygodactyli, characterised as "coarse or hard vegetable-feeders;" but it is inexpressibly painful to point out the innumerable errors or oversights of this kind. It would seem that the Professor, satisfied with the laurels earned in early life, is now standing still while a crowd of competitors are passing him in the race. He appears complacently to have placed his chair and to have said "thus far and no farther," and to have believed that the advancing waves of human research will never venture to overtake him. This is a fatal mistake; let no man who presumes to teach, think that he is too old to learn.

EDWARD NEWMAN.

Birth of Polar Bears in the Zoological Gardens.

By E. W. H. HOLDSWORTH, Esq., F.L.S., &c.

THE reproduction of polar bears in captivity, amid scenes and under circumstances so different from those to which these truly northern animals are accustomed, is perhaps of sufficient importance and general interest to deserve a notice in the 'Zoologist,' especially as the case to which I am about to refer is the *first* which has ever been recorded. I will begin by saying something about the ursine parents. The ages of the two adult polar bears in the Zoological Gardens are not certainly known, but both animals have been for many years inhabitants of their present limited enclosure. The female —the smaller of the two—is an old friend of mine, of nearly sixteen years' standing. The male is a good deal larger, and is a fine representative of the species; it was captured in Barrow's Straits by some adventurous whalers in 1850, and was brought to England, secured, it is said, in a cask. The process of incarceration must have been a difficult one, and the capture of such an animal, grown up, as it had, amid the wild regions of the icy north, may be recorded as no mean triumph of man over the brute creation. On this animal's introduction to its present domicile, it evinced the most praiseworthy desire for freedom, and climbed about the strong iron railings of its enclosure with a skill and perseverance such as only an apprenticeship on icebergs could have enabled it to exhibit. Its efforts to escape were unceasing; so that extra precautions were necessary to secure the animal in its den, and it was only when an open iron roofing had been fitted, besides the incurved spikes already terminating the top of the high railings, that the imprisoned bear could be induced to submit to its fate. The difficulties usually attending the first meeting of two savage animals in a confined space were not wanting when this male bear was introduced into the den already occupied by his future companion.

After being accustomed for a few days to look at one another through an iron grating they were both allowed the free run of the enclosure, and then ensued a most animated and snarling discussion about Might *versus* Right—physical force against priority of occupation. Fortunately the dispute did not terminate in blows. Each animal soon took up its position in an opposite corner; and if one attempted to move a growl from the other cautioned it to be quiet; it was evidently "Touch me if you dare" on both sides. After a time the two bears would advance towards one another, snarl, and then retire to their corners, the stranger always moving backward, and presenting a firm front to his supposed enemy; the female, confident in her right of place, would turn and walk away in her usual manner, contenting herself with sidelong glances at her companion. At last, however, peace was declared (except at dinner-time), and, companions in misfortune, they now appeared as happy together as if they had never quarrelled. The retrograde movements of the male bear, originating in suspicion, have, however, been confirmed into a habit; and, without any reference to the position of his mate, after pacing the length of his den, he very commonly backs the whole distance to his original corner.

During the last few years hopes have existed of young polar bears being added to the list of novelties in the Gardens, but they were not realized until the 5th of November, 1861. On that day the keepers observed a renewal of the old family quarrel, and it was soon ascertained that two young bears had been added to what I may call the polar circle. Unfortunately, both little ones were dead, probably killed by the mother, as one of them was much injured. These young animals are each about thirteen inches long, and would have stood nearly seven inches high,—miniature polar bears, well proportioned and covered with a coat of fine white silky hair, except on the ears, which are quite naked. The little things look like large white tailless rats. They are now stuffed, and will soon take up their quarters on the shelves of the British Museum.

In February, 1860, at an evening meeting of the Zoological Society, Mr. Bartlett called attention to the size of some young hybrid black and brown bears which had been produced in the Gardens on the last day of the previous year. When born they were only as large as rats, and their eyes did not open until they were about five weeks old, when the young animals had attained the size of a common rabbit. It has now been shown that the polar bear agrees with its congeners in producing its young of a disproportionately small size.

It is well known that bears bring forth during the period of hybernation, and, at that time, are for a long interval without food. No attempt at hybernating has hitherto been observed among the bears in the Regent's Park; yet, as winter approaches, some of these animals show failing appetites, and, if any young ones are produced, the mother ceases for a time to feed. The polar bear ate nothing for a week after her cubs were born. This curious fact shows us that the absence of a desire for food is not wholly dependent on hybernation, but is especially marked under those circumstances which make other quadrupeds most ravenous. The period of gestation is seven months, and union continues about two hours.

The two polar bears in the Gardens daily consume from sixteen to eighteen pounds of fish between them, and, under ordinary circumstances, winter sees no diminution in their appetites. Both animals always appear very unwilling to enter the water, and rarely venture in further than they can help; possibly they have learnt the advantage of dry clothes, and, moreover, that little is to be gained by a wetting except at dinner time.

* * *

I may add that on the 27th of December, 1861, three little rat-like brown bears were born in the Gardens, and are still alive and doing well, the paternal honours in this case belonging to the well-known gigantic animal sent a few years ago from Norway.

E. W. H. Holdsworth.

January 8, 1862.

Weasel fascinating Small Birds.—Returning from church one Sunday morning, my attention was drawn to a clump of six or seven small trees planted on the village green. Five sparrows were fluttering about, near to the ground, and uttering loud cries of alarm. I drew cautiously nearer to the place, and saw a weasel in the middle of the clump. He was facing the birds, who seemed to flutter helplessly around him. He suddenly made a spring and snatched a bird, and at the same instant I threw a stone at him, which alarmed him, and he made off into an adjoining farm-yard, retaining his prey in his mouth. I had often heard of the power of fascination possessed by some animals, but never saw anything approaching to it before.—*J. Ranson; York.*

Cream-coloured Mole.—I have in my possession at present a beautiful cream-coloured mole, which was killed, in August last, in a hay-field near this village. A similar one was also caught in October on the farm adjoining; it, however, made its escape, after being a few hours in captivity.—*Thomas Thompson; Winlaton, December* 7, 1861.

[I have met with numerous instances of cream-coloured moles, but never with one perfectly white.—*E. Newman.*]

In re Leporines. — It is difficult to visit Leadenhall Market, or any other market where living animals are exposed for sale, or any dealer in living animals, or any spot where living animals are exhibited, though not sold,—as in our Zoological Gardens,—without seeing, in considerable abundance, an animal called a leporine; and without hearing, should any inquiry be made, that the said leporines are hybrids between the rabbit and the hare. Again, it is difficult to open the 'Field' newspaper—which, by the way, is an admirable repertory of sporting and field lore—without lighting on a discussion as to the value, origin and characters of the leporines in question. Now the mind of the true naturalist has not only an inquiring, but almost a doubting turn, and this I fancy more wholesome than too eager a credulity, than such a swallow, for instance, as would gulp a meteoric stone, or such a stomach as could digest the wondrous but circumstantial narrative thereanent, when swallowed. Now this sceptical spirit or doubting turn of mind has largely fallen to my own share; and I do not take on trust that these leporines are hybrids between rabbits and hares, for two reasons; the *first* and *primâ facie* reason is that they resemble rabbits and not hares; and the *second*, that they are extremely fertile, which is very rarely, perhaps never, the case with hybrids between distinct species of either quadrupeds or birds; instance the mule as a hybrid between horse and ass, and the mule hybrid between canary and goldfinch. Seeing then that appearances and probabilities are equally against the assumption that leporines are hybrids, half-hare, half-rabbit, I may mention another character they possess that is purely a rabbit character. The female or doe makes a cozy nest of hay, and lines it with fleck torn from her own belly: in this nest she brings forth; and her young ones are born perfectly naked and perfectly blind. I need scarcely mention, except for the edification of the few non-naturalists who may peruse these lines, that the female hare makes no nest; that she tears no fleck from her body; and that her young are brought into the world with an abundant covering of hair, and possessed of eyes remarkable for wide-openness, brilliancy and beauty. Before the little world of naturalists will believe in the hybridity of these leporines a number of very difficult questions must be answered clearly and definitely:—

1st. Who raised the first litter of leporines?

2nd. Where were they raised?

3rd. Was the male or female parent the hare?

4th. By what management did the breeder achieve so unnatural a combination?

5th. What was the period of gestation in the first instance; and what is it now, when the leporines breed freely among themselves?

6th. How does the breeder account for the disappearance of all hare characters, except some slight approach in size and colour, which all naturalists agree in regarding as totally unimportant?

Until these questions are satisfactorily answered I shall continue to regard leporines as a breed of tame rabbits, differing no more from the common wild rabbit than do the lop-eared, the silver sprigs, &c., &c.—*Edward Newman.*

Ornithological Notes from Edinburgh.—On the 13th of last month a bird-catcher showed me several hawfinches, bramblings and crossbills, which had been caught by his boys near Morningside, about two days previously: one of the hawfinches, a very fine male, having died soon after its capture, I took it away as a specimen, and on examining the stomach found that it contained nothing but a few fragments of barley and a little coarse sand. On the 15th, the same man brought me four curlew sandpipers and three dunlins, all of which he killed at a single shot on the Fife coast: he said that they were in company, with many others, feeding upon the sand, close to the water's edge. On the 19th of the present month a friend of mine picked up the remains of a little auk upon the sands at Portobello: it was a female, and had apparently been dead for at least a week; the stomach was quite empty. A few days ago I observed nine snow buntings feeding among the bushes which cover the face of the steep rocks upon the south side of the Calton Hill: the ground being frozen at the time the poor birds were probably led by hunger, rather than by choice, to seek their food in this unusual situation.—*Henry L. Saxby; 54, Gilmore Place, Edinburgh, December* 28, 1861.

Occurrence of the Golden Eagle near Driffield.—Early in this month I received a fine adult golden eagle in the flesh, from Skerne, near Driffield, shot by J. Kemp, gamekeeper to A. Bannister, Esq., of Hull. The bird in question is a male, and measures from beak to end of tail 2 feet 9 inches, to the end of toes 2 feet 6 inches, spread of wings 6 feet 7 inches; weight 8 lbs. 5 oz. I have also had lately brought me, to be preserved, stormy petrels, little auks and the gray phalarope.—*Alfred Roberts; King Street, Scarborough, December* 27, 1861.

Occurrence of the Merlin near Alton.—Last week a female merlin was shot at Chawton, about a mile from here. I have never known the merlin shot in this neighbourhood before.—*Philip Crowley; Alton, January* 7, 1862.

Occurrence of the Great Gray Shrike at Jevington, Sussex.—A beautiful male specimen of the great gray shrike (*Lanius excubitor*) was shot, on the 19th of November last, at Jevington, four miles from Eastbourne, by Mr. W. B. Read, farmer, of that place, and is now in my possession. Mr. Read informs me that he several times since saw another about the same spot, but has been unable to succeed in shooting it. On dissection I found the head of a small mouse in the stomach, and which I have preserved in alcohol.—*John Dutton; South Street, Eastbourne, December* 18, 1861.

Query about the Robin.—It is the general opinion in the North Riding of Yorkshire that the young birds kill off the old ones. For two years I have endeavoured to ascertain the truth of this opinion, but without success; for, though the young ones are common in June and July in the gardens and hedge-rows, yet the old birds are very rare indeed. In August and September the well-known breast is common enough. I should feel obliged by information as to whether this opinion prevails in any other county, and if so, whether there are any grounds for it.—*J. Ranson; York.*

Large Flocks of Magpies.—In reply to your correspondent's query (Zool. 7817) I beg to state that previous to the year 1859 large flocks of magpies were frequently observed in the neighbourhood of Stocksmoor, near Huddersfield, when the weather was severe; sometimes they numbered thirty, or even forty, in a flock. But since that time the gamekeepers have nearly exterminated the species in that neighbourhood, and where formerly you could see scores you cannot see one now.—*B. Gibson; Wakefield, December* 27, 1861.

Occurrence of the Crossbill near Eye.—On the 18th of October last my brother shot a very fine male example of the crossbill (*Loxia curvirostra*): it was feeding in a fir plantation close to our house, eating either the seeds of the fir or insects contained in the cones; as he skinned it before I had an opportunity of examining it, I am unable to say on which. According to Macgillivray, they sometimes visit this country in large flocks.—*R. Tyrer, jun.; Eye, Suffolk, November* 8, 1861.

Food of the Wren.—In a paper on the habits and food of the wren by Mr. Brockholes, published in the 'Transactions of the Literary and Philosophical Society of Liverpool,' this gentleman states that *snails* constitute a large portion of the food of this little bird during the winter,—that it often carries them to a particular spot, where it detaches the animal by breaking the shell, or by other means, and then eats it; and that the broken shells are often noticed lying in considerable numbers together, by persons who are ignorant of the cause of their destruction. I cannot conceive how Mr. Brockholes can have fallen into this error: a moment's consideration must convince any one that a wren could not by any possibility break the shell of a snail, and if it could detach the animal in any other way it could not swallow it. I thought every one who has paid the least attention to birds was aware that it is the song thrush which feeds upon snails, and this bird almost always carries them to a particular stone to break the shells. The wren feeds entirely upon small insects and worms, and in winter frequents ditches and brooks for the sake of the small red worms so abundant in the mud: the stomach of one killed a day or two since contained nothing whatever but these worms. Mr. Brockholes also states that wrens roost in such numbers in a single hole in a haystack that a dozen may be taken out at once in the hand: if this is the case at Liverpool wrens must be far more numerous there than they are at Epping.—*Henry Doubleday; Epping, January* 4, 1862.

Variety of Partridges.—It may be interesting to some of the numerous readers of the 'Zoologist' to learn that the variety of partridge, of which I sent you an account last year (Zool. 7544), has not disappeared from the parish of Shebbear. A covey of twelve birds, of the same description, with a single female of the ordinary plumage, appeared during the present season of 1861-2, in the same locality, not more than half a mile from the spot where the birds were killed in the previous year,—in fact, I may say that they occupied the same ground. Four of these have come into my possession; four still remain; another and the old hen were also accounted for; of the remainder I have learned nothing, but doubtless they have fallen victims to some sportsman's gun. All those brought to me were in a slight state of moult, but show exactly the same peculiar markings which characterized the birds previously recorded, with the following exception,—the existence in two of them of some few white feathers on the breast. This, I think, will go far to show that *variety*, and not *hybridity*, must be the light in which these singular birds should be regarded,—more especially so, indeed when the existence of an ordinary old hen in the covey, as above stated, is taken into consideration. The white feathers are certainly few in number,—not more than two in one specimen and ten in another. The other bird killed, which did not reach me, appears to have had a greater number of these feathers, as they particularly attracted the attention of the man who bagged it, and who would have brought the specimen to me if his dog had not injured it. I am told that the birds still remaining keep to themselves and do not associate with other partridges occupying the same ground. The farmer on whose estate they are, informed me that during the snow in November they were seen running about in his yard. Beyond recording the above, I can add nothing to what I wrote last year respecting this variety. I have failed in obtaining any correct information respecting the importation of foreign birds—or, more probably, eggs—by a gentleman, who some years since lived about ten miles distant. More than one person has mentioned the fact to me, and I think it very probable that such was the case; however, whether, if true, this has anything to do with the present birds the readers of the 'Zoologist' can form as correct an opinion as myself.—*W. S. Hore; Penrose Villas, Barnstaple, January* 7, 1862.

Examination of a Specimen of Sabine's Snipe.—Mr. Vingoe and myself have been engaged this evening in examining minutely a specimen of snipe, in every respect as to colour, arrangement of markings, and dimensions answering the description of Sabine's snipe (*Scolopax Sabini*). There is an entire absence of the longitudinal stripes on the back, with the uniform brown-freckled plumage from the chin to the vent; the facial mask from the corner of the mouth to the eyes, and so all round under the throat, is dull black; a black stripe, half an inch wide, runs from the top of the head to the nape of the neck, with a few rusty brown spots sparingly distributed; the under surface of the quill, secondary and tertial feathers blackish gray, as are also the lateral under scapularies; the whole of the upper plumage marbled with deep black and rust, uniform throughout; the tail with alternate black and rusty bars. With all these exterior characters in perfect accordance with the various figures of Yarrell, Selby and others, I have, I confess, felt very little hesitation hitherto in not believing that the species is distinct, and not, as it has been suggested, and in fact strongly set forth by some modern naturalist, a permanent variety of the Scolopax Gallinago; but I confess that I am at present at fault by the great character of the number of tail-feathers wanting in the present example. In counting the feathers with great care three times there was no doubt as to the result—*viz.* fourteen, and not twelve. This number favours its alliance to the common snipe, which has fourteen also. This bird was killed near Carnanton, the residence of Humphrey Willyams, Esq., the same locality from whence the spotted eagle (No. 2) was lately obtained. The specimen is now preserved for Mr. Brydges Willyams, and in case it should be desired to have submitted the specimen for the inspection of any of the scientific societies in London, I will apply to him to allow it to be sent, and I have no doubt it will be granted. I mention this in case my notice of this curious bird should excite a strong interest in the further investigation of its character. — *Edward Hearle Rodd; Penzance, January* 3, 1862.

Occurrence of the Egyptian Goose at Alton.—A fine specimen of the Egyptian goose was shot on Oakhanger Pond, near Alton, on the 16th of December last.—*Philip Crowley; Alton, January* 8, 1862.

[I always feel an inclination to consider the Egyptian geese killed in this country as escapes: this beautiful bird is a great favourite on ornamental waters.—*Edward Newman.*]

A clever Duck.—An intimate friend of mine here, himself a man of Science, relates to me the following curious fact, which occurred before his own eyes a few days ago. He keeps a pair of ducks in his yard: one day he remarked the drake dodging about in one corner, and presently saw that he had "cornered-up" (to use a Yankeeism) a little half-grown mouse. The drake cleverly cut off its retreat on every side, the angle of the wall much assisting him; at last he made a dash and seized mousey in his broad beak. Here he held his prey for some moments, as if not knowing what to do with it. Then, all on a sudden, as if struck with a bright thought, he marched straight to the water, at some distance, and plunging his beak beneath the surface, kept the mouse submerged till it ceased to struggle. He then withdrew it, and with some slight difficulty managed to gobble it up. The carnivorous appetite is curious, the skill displayed in capture still more so, but the ingenious resource of drowning the active mouse, in order to eat him securely and comfortably, most curious of all. My friend (I may mention his name, Mr. Henry Curtis, known by repute to every rose-lover, almost to every botanist) is so sober, grave and upright a man that I have the most absolute confidence in the truth of what he told me. – *P. H. Gosse; Torquay, January* 4, 1862.

Occurrence of the Little Auk Inland.—I wish to add the following to the cases of the occurrence of the little auk inland which I find in the 'Zoologist' of this month. I received a letter, from which the following is an extract, from my friend and neighbour, William Butler, Esq., of Lee Court, Empshott, two miles from hence:—"Lee Court, November 19, 1861. My dear Sir,—I have this day forwarded to you a bird which one of my labourers picked up near his cottage: it ran, but made no attempt to fly." The bird soon died, and had refused all food. It has been stuffed, and is now in the Museum of the Alton Institution.—*Thomas Bell; January* 7, 1862.

Variety of the Common Gull.—At Balta Sound, last December, I shot a common gull (*Larus canus*) of such small size that its whole length (fourteen inches and a half) did not exceed that of the wing of an ordinary specimen, when measured from carpal joint to tip. It was an adult male in full plumage, but the bill, legs and feet presented a very unusual appearance, being strongly tinged with yellowish brown.—*Henry L. Saxby; 54, Gilmore Place, Edinburgh.*

Plumules in the Wings of the Genus Pieris.—At a late meeting of the Manchester Literary and Philosophical Society Mr. John Watson read a paper "On certain Scales of some Diurnal Lepidoptera," in which he recommends a new and careful study of this subject. In some genera peculiar scales, called plumules, have long been known; but examination with the binocular microscope shows that they are not flat, like ordinary scales, but cylindrical and hollow. They have been found only in certain genera (named in the paper) at present, and on the males alone; they possess generic resemblances and specific differences, each species displaying its own distinguishing variety. One of great beauty and novelty, found only on two African butterflies, Pieris Agathina and P. Chloris, was described, and some very fine drawings of it, by Mr. Joseph Sidebotham, were exhibited, and also other figures by him of about one hundred species never figured before. The names and habitats of the insects were given, and the author pointed out the value of these scales for the assistance of the scientific entomologist in arranging genera and species. He then entered into the question as to their probable use as air-vessels in the economy of the insects possessing them. The chairman remarked that the scales of the Lepidoptera may prove as valuable in determining species as the scales of fishes. Mr. Sidebotham alluded to the value of the binocular microscope in defining the cylindrical form of the plumules, and described the mode of finding them *in situ* by breaking the wing. Mr. Watson stated that some of Mr. Sidebotham's excellent drawings were taken under the eighth objective, magnifying 750 diameters. Mr. Watson further said that he had examined the wings of 400 specimens of the Papilionidæ, but had not discovered any plumules in that family. He also alluded to several so-called species from South America, of which no males have yet been found, others of which no females have yet been discovered, and suggested the possibility of some of these being male and female of the same species, to ascertain which careful examination of the scales might be useful. Mr. Watson exhibited a number of mounted specimens of the plumules, and four cases of the Lepidoptera, from whose wings the ninety-eight drawings figured by Mr. Sidebotham were taken. They were principally Pieris, Anthocharis, Euterpe and Eronia. Amongst the former were some new and unnamed species from Celebes, with rare specimens from Venezuela, Quito, East and West Indies, Africa and other parts of the world.—'*Quarterly Journal of Microscopical Science*' *for January*, p. 69.

[It is interesting to see this, the oldest of all entomological inquiries, again revived; a similar attempt was made in 1828, when the plumules of fifty-four species of male Pierides were figured, and the objects themselves examined at a meeting of the Entomological Club. The idea that these plumules had ever been considered "flat" is new to me.—*Edward Newman*].

Viscid Lines in a Spider's Web.—As I have, although very casually, alluded in this paper to the large garden spiders, I may, perhaps, be allowed to mention a fact connected with them which came under my notice about the same time. It is well known that in all geometric spider webs the concentric lines, with the exception of those in the very centre, are most beautifully dotted with a viscid substance, to aid in the capture of insects. Mr. Blackwall has, I believe, computed that there are more than 100,000 of these gummy drops in a web which is made in about half an hour: it has always, therefore, been a puzzle in my own mind how this part of the process was effected, and as I had been unable to find any one who could give me a satisfactory explanation, I thought I would carefully watch a spider during the operation, when, with only a pocket lens, I could distinctly see that the viscid lines, as first drawn from the abdomen were not dotted. On a careful examination with a microscope, which I took into the garden, the thread appeared only slightly thicker than an ungummed line, but after a very short time undulations appeared, and subsequently, at the most regular distances, the viscid matter formed into alternating large and small globules. The whole process is such a beautiful illustration of molecular attraction, which Mr. Rainey has been so patiently and profoundly working out with regard to the highest organic structures, that I thought this simple example might interest some of our members. The cold weather has, of course, driven away this spider till next autumn at least, but the same result can easily be obtained artificially.—*Richard Beck, in 'Journal of Microscopical Science.'*

Mangold Wurzel Crops injured by a Species of Anthomyia.—With a view to ascertain the origin of the evil, I paid frequent visits to a mangold field, in order to discover the fly which was the parent of the leaf-mining larvæ whose existence within the cuticles an intelligent farmer had first pointed out to me. I searched hundreds of leaves, in order to obtain possession of some pupæ, but in vain. I brought home several leaves containing full-grown larvæ, which I anticipated would soon become pupæ, and placed them in water, in hopes of thus being able to secure a pupa or two; but I found the larvæ always dropped out of the leaves. Failing in this, I determined to watch the insects in the field, and my suspicions were soon fixed upon a two-winged fly with reddish brown eyes, which was very abundant on the mangold leaves, and seemed evidently to have some object in view beyond the mere ordinary and incidental one of settling upon them. I observed, on the under surface of the leaves, a number of small white cylindrical ova, in clusters varying from two to six or eight together. On holding these up to the light I could clearly see from the track, which extended from the ruptured ova between the cuticles to the larvæ in another part of the leaf, that these were the undoubted ova of the damaging insect; but it still remained to prove that the suspected fly was the parent of the ova. I therefore made a microscopical examination of the eggs which had been deposited on the leaves; these, under a power of 250 diameters, presented a beautiful reticulated structure. I then dissected a number of the flies, whose abdomens were evidently distended with ova, with a view to compare the eggs in the ovary with those I had already examined. I found them in every stage of development, and discovered some of the exact shape and size, though of softer consistency than the eggs on the leaves, and presenting the same network structure, characteristic of those which had been naturally excluded. About this time I was made acquainted with Mr. Curtis's description of the male Anthomyia Betæ, which exactly agreed with specimens I had taken myself, and as I afterwards discovered a couple of flies *in coitu* I could no longer have any doubt on the subject. It appears singular that this is the first instance on record of the mangolds suffering to any extent from the depredations of these larvæ, the direct cause of the injury last year being the large proportion of female flies compared with the number of the males, being on an average as twelve to one: from the fact of the males only being hitherto recognised, there can be little doubt that in former years this sex predominated, hence the immunity of the plants from injury up to this time; but, as to the cause, whether atmospheric or otherwise, of the large proportion of females during the last year, this is a question which perhaps can never be solved. The female fly continues to deposit ova quite late in the season; I found this to be the case as late as the first week in November. I cannot think that the larvæ change to pupæ *in situ*; I never could detect a single pupa in the leaf, and my observations, so far as they go, tend rather to show that the maggots drop out from between the two cuticles, and undergo their metamorphosis in the ground; at any rate, I could occasionally discover, by scraping away the soil at the root of the mangolds, here and there a larva; indeed, if the late broods do not remain as pupæ under the ground, how are they able to survive the winter, and by what means is the continuation of the species to be carried on? The larva, at the time of the rupture of the ovum, is about a line long; it is armed with two strong hook-shaped mandibles; it grows fast, and reaches the size of about the third of an inch in length, feeding upon the green parenchyma of the leaf.

ANTHOMYIA BETÆ, *Curtis*.

Female. — The ground-colour of thorax light brown, marked with five or six darker longitudinal lines, with four or five bristles similarly disposed; abdomen rather variable in colour, generally light brown or ashy gray, with a distinct or indistinct darker line down the middle, occasionally with irregular dusky patches, which sometimes become so confluent as to give the abdomen a uniform dusky colour; shape of abdomen oval, narrow at the extremity; head semi-orbicular; eyes reddish brown, remote, destitute of hairs; antennæ velvet-black, drooping, arista bare; face satiny white, with black bristles, having a broad bright chestnut band down the centre; ocelli three, situated on a satiny subtriangular spot on the crown; wings the size of the body, tinged with tawny at the base; alulæ of moderate size; legs black, tawny at the base, long; proboscis dark, with tawny tinge; whole length nearly three lines.

The female is readily distinguished from the male; the more general obvious differences being the shape of the abdomen, which is oval in the female, but linear in the male; the remoteness of the eyes, those of the male being nearly contiguous; and the less bristly character of the female. Two important practical questions will naturally suggest themselves to the agriculturist; 1st. Is this insect likely to abound again in such numbers as to affect the mangold wurzel crops this year? 2ndly. If it does so abound, what remedial measures can the agriculturist adopt? To both these queries it is perhaps impossible to give a satisfactory answer. It has been seen that the injury done to the plants last year is owing, in a great measure, to the large proportion of female flies, a fact which depends on phenomena, of the nature of which we are wholly ignorant. A frost of some weeks duration is generally considered to be the means of destroying many noxious insects, and no doubt this is true to some extent, but it will be remembered that the winter of 1860 was tolerably severe, and yet these Anthomyiæ abounded in the following spring. With regard to the second problem, the only possible direct mode of lessening the evil is, as it appears to me, to examine the leaves when the mangolds are young, and when, in consequence, they are most likely to be injured, and to crush between the finger and thumb the little groups of ova, which can readily be detected by the naked eye, of course this would demand a good deal of valuable time, and perhaps for this very reason, may be deemed altogether impracticable. There can be no doubt that many of our smaller birds are of great use to us in helping to diminish the extent of the injury, and since the first appearance of the larvæ of this destructive insect is contemporary with the time when birds are very busy seeking food for their young, perhaps the farmer's best policy is to abstain from an indiscriminate slaughter of the feathered tribes, and to leave with them the chance of being of considerable benefit to him.—*Journal of Microscopical Science, January*, p. 40.

Life-Histories of Sawflies, Translated from the Dutch of M. Snellen Van Vollenhoven. By J. W. MAY, Esq.

(Continued from p. 7857.)

LOPHYRUS PINI, *L.*

Linn. Syst. Nat. ii. 922, 14. *Fabr. Syst. Piez.* 22, 7. *Panz. Faun. Germ.* H. 87, Tab. 17, et H. 119, Tab. 5. *Schæff. Icon.* Tab. 67, f. 13. *Hartig, Blatt-und Holzwespen*, p. 141 and following. *Lepel. de St. Fargeau, Mongr. Tenthr.* p. 54. *Ratzeburg, Forstins*, Th. iii. 85. *Snellen van Voll. Schad. Ins.* bl. 52 and following.*

Lophyrus ♂ niger, abdominis segmento primo albo-maculato, pedum genubus, tibiis tarsisque pallide rufo-flavis; ♀ sordide flavus, maculis tribus dorsalibus thoracis et macula magna irregulari in abdominis dorso nigricantibus.

The destructive animal which we are about to treat of has been long known, as much, probably, from the great numbers in which it generally occurs as on account of the injury it occasions, and we find it mentioned in the works of the founder of the system. Since his time so much has been written about it that it becomes a matter of some difficulty to keep within the bounds of a periodical, and at the same time not to omit notice of matters deserving to be recorded.

I will begin by my own observations. On the 10th of July, 1845, I received from Dr. M. C. Verloren six larvæ of Lophyrus Pini, which he had found near Zeist or Driebergen. These larvæ fed, whilst in my possession, on the leaves of the common pine (*Pinus sylvestris*). They pupised among the withered leaves, at the end of July. The first appearance of a perfect insect from the cocoon was on the 5th of August; this was a female; the others remained over the winter, and did not appear until the month of June in the following year. I have since had the larvæ more than once, and have succeeded in rearing them, some males among the number, but I have kept no record of the dates. The following appears from my notes of the metamorphoses of the larvæ. The larva attains a length of one Paris inch and three lines, or 35 mm. The whole body is yellowish green. Head ochre-brown. with darker mandibles, and two round black spots, in which are the eyes. Obliquely below these are the little feelers, which are also darker than the ground colour. All my larvæ had a triangular spot on the crown of the head, blackish to quite black, and always darker than the ground colour; some individuals had, in addition, two small spots on each side of the head, as represented in the above-quoted work of Dr. Hartig, pl. iv. fig. 1, c. I have not observed a head marked as represented at fig. 16 of the same plate.

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* To these may be added, J. O. Westwood in 'Gardener's Chronicle' for 1852.

In some individuals the yellowish green colour of the body passes into greenish yellow; I have seen some of our Netherland species of this tint. The greater number of those which I reared had three darker stripes on the back and sides; that on the back was always conspicuous, while those on the sides were faint. I have represented a rather dark individual at fig. 1.

Each segment of the body of the larva is divided into six folds, the first, third and sixth having little dark sharp hairs; these are not distributed in the manner represented by Hartig (pl. iii. fig. 25) in the work above referred to, namely only one row of hairs on each fold, but, as I have endeavoured to show at my fig. 2, growing irregularly all over the fold. At the side, almost in the first fold, is found the elliptical spiracle. Close below and behind are two little cushions or elevations of the integument, also covered with similar pointed hairs. The neck is of the same colour as the under side of the abdomen, namely a dirty greenish yellow. The thoracic legs are black, with dull yellow rings; the sixteen abdominal prolegs are of the same colour as the belly; above each are two black transverse marks, the second being almost twice the length of the first; these form a row on each side of the body, called by Hartig "die schwarze Semicolon Reihe." None of my larvæ showed any traces of the spots on the first segment mentioned by this author. The last segment is of the same colour as the ventral surface, but entirely covered with spinous hairs and having two oblique green stripes. The author above referred to also mentions some varieties of these larvæ, among others one entirely pale yellow, the head pale brown and without any markings, not having even the two stripes above each proleg. I have not observed any examples of this variety.*

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* The following has been communicated to the translator by the author since the above was published in the original. "I have since received from Gelderland the yellow variety almost without marks above the legs. I reared this larva on leaves of the Weymouth pine. The imagos appeared on the 27th of May, showing no difference from the ordinary insect. In July, 1858, I also had some larvæ, which were taken at Wassenaar, and which deviated greatly from the usual type. The head was yellowish green, with two blackish spots at the sides surrounding the eyes, and another

Immediately after each moult the heads of my larvæ were yellowish white and the thoracic legs pale green; this colouring remained but a very short time. Not long after the moult the former became brown, and the latter assumed the usual darker tint.

My first larvæ were full-grown by the end of July. They then spun cylindrical cocoons among the withered leaves lying at the bottom of the glass vessel in which I kept them. These cocoons were from 4 to 5 lines or 10 to 12 mm. in length; they were rounded at either end. They may be known by the strength and pergamentaceous nature of their walls; the colour is, however, very variable, for those individuals which spin in and under the moss at the foot of the pine trees generally form brown, sometimes even dark brown, cocoons, while those which spin up in the angles of the twigs usually make silky ashy gray, white or yellowish white cocoons. (See fig. 3).

In the case of a very nearly allied species, Lophyrus similis, I once observed that all those which had spun up on the twigs were attacked by parasitical wasps, while those cocoons which had been formed at the foot of the tree produced perfect sawflies. I cannot possibly say whether this was merely a chance observation or whether it was in any wise an illustration of a rule, but I can confidently assert that no such rule or, if one may say so, law of disease is observable in the case of Lophyrus Pini. Hartig remarks that the spring brood, which appears in July, spins up among the branches, whilst the remainder hide in the moss; but, as in the case of those I observed, out of one and the same brood one individual became an imago after being one month in the pupa state, whilst the others remained over for eleven months, I find some difficulty in accepting his statement without further observation. Those cocoons which have been opened by the sawfly itself may be known by their having a little lid, as it were, cut out as if by a sharp instrument, as shown at fig. 3, whilst those cocoons which have produced parasitic wasps have a small oval or round hole at the side, and on the other hand those which have been infested by parasitic Diptera have an irregular opening at one end.

Inside of this pergamentaceous cocoon the larva passes sooner or

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spot on the clypeus; there was also a black circle immediately round the eyes. Abdomen dull green, greenish yellow underneath; a very irregular black stripe extended over the back. On a level with the stigmata was a row of eleven black spots; similar marks were observable above the anterior legs; over the prolegs was a pitchy black spot preceded by a black dot; the terminal segment was smooth, without wrinkles. From these larvæ were reared one male and three female imagos."

later into a pupa, in which the external divisions of the body are clearly indicated. This pupa is at first of a light cheese-colour, but gradually assumes the tint exhibited by the little animal on its escaping from prison. Fig. 4 represents a female pupa. After having emerged from the pupa state by casting a very thin enveloping skin, the perfect insect, in order to effect its escape, gnaws the round lid out of the cocoon, of which we have just spoken.

From the greater number of those cocoons which have remained hid in the moss during the winter the imagos are developed, some in June and some in the first half of July, so that their time of appearance coincides with that of those imagos of which the larvæ have fed in the spring of the year, and which have only passed about a fortnight in the pupa state. From those same cocoons, namely those which have remained over the winter, some sawflies make their appearance in April, or even, if the season be favourable, in March. When about to deposit their eggs they make with their saw an incision in the side of a fully developed fir leaf, extending the whole length of the leaf, and lay their eggs in the opening, beginning at the base and proceeding towards the tip. The number of eggs varies from two to twenty, or, according to Müller, (Afterraupenfrass, 2 Auflage, Aschaffenburg 1824,), even to thirty. Each egg is separately covered by a fluid ejected from the ovipositor. The egg is so placed that its longer diameter is parallel with the midrib; the egg itself is elliptical or cylindrical, with rounded ends; the colour is yellow; length not exceeding 1 mm. By degrees, as the germ is developed within the egg, the latter swells up and the shorter diameter becomes equal to the longer. In consequence of this the sides of the leaf also swell up. After an interval of a fortnight or three weeks the young larvæ are born. During the first period of their existence the larvæ live together in companies of from fifty to eighty, mostly keeping very close together and consuming the leaves at the sides only. They afterwards gradually disperse and eat up the midrib right down to the sheath.

The larvæ hatched in May consume last year's fir leaves during May and June, spin up in the beginning of July, principally among the leaves of young shoots, and generally appear as imagos in about a fortnight. These again lay eggs, the larvæ from which during August and September live on the last year's leaves as well as on the new year's, descend in the middle of September, and spin up in dark-coloured cocoons among the moss and *débris* at or near the roots of the trees. From these cocoons the imago makes its appearance in the following spring. Sometimes, however, these cocoons remain twenty-one months instead of nine before the perfect insect comes forth.

The time of appearance of these sawflies is thus somewhat irregular, and individuals of this species will sometimes produce but one brood, and at other times two broods, in the same year. However, the rule is generally only one generation in the year, the several stages being as follows. Two or three weeks suffice for the egg state, two months for the larva out of the cocoon, nearly nine months for the larva in the cocoon, only a few days for the pupa state, and but a very few days for the perfect insect before the laying of the eggs takes place. In the usual course April and June are the months in which the insect is to be met with on the wing.

The male of this common sawfly is 3 to 3½ Paris lines (from 7 to nearly 9 mm.) long, and expands 7 to 7½ lines (between 16 and 18 mm.). The joints of the antennæ are beautifully pectinated on both sides, from one end to the other, the teeth on the outside being much longer than those on the inside; the colour is black or brown-black. Head black, punctulate, with dark gray pubescence; three ruby ocelli arranged in an acute triangle; the appendage to the upper lip and the extremities of the palpi rufo-testaceous. Thorax black, strongly punctulate, pubescent; tegulæ brown. Wings pale smoke-colour; nervures and stigma dirty yellow. There are two whitish spots on either side of the first joint of the abdomen; they are situated on that part of the joint in question forming the dorsum, and which reaches down in a point to the under side of the abdomen. For the rest the abdomen is finely punctulate and black, with the exception of the anal extremity, which is reddish. The legs are black from the base to half way the femur, the remainder being pale rufo-testaceous, only the extremities of the tibiæ somewhat darker and inclining to brown.

Klug mentions a variety, from the neighbourhood of Berlin, having the under side of the abdomen pale brown, with some black stripes, and a similar variety is observed by Hartig in the Harts, near Neustadt-Everswalde.

The colouring of the female is entirely different; she is at the same time a little longer and much broader, her length reaching to 4½ lines, or something more than 1 centimetre, and having an expansion of nearly 9 lines or 19 mm. The general colour of the body, with the exception of the head, is a dirty more or less brownish but shining yellow; the head, on the other hand, is decidedly brown, in some individuals even passing over to a black-brown; beneath the eyes and the parts of the mouth the colour is paler, being dirty yellow. The antennæ have 18, 19 or 20 joints, the basal joints being bright yellow, the others dirty yellow or brownish; they are distinctly serrated on the under side, but are not provided with the beautiful pectination of the male. On the thorax are three large black or dark purple spots, the first covering nearly the whole of the surface of the anterior division of the mesothorax; the two others, which are situated at the sides of the thoracic surface, are elliptical and curved, having their convex sides towards each other. Between these last are two smaller spots. In dark-coloured individuals the black colouring is more diffused, in some instances covering the whole of the middle of the thorax. The scutellum is yellow, the posterior margin being generally black, which sometimes extends beyond the middle. In Germany, where this species is more generally met with than with us, individuals have been found having the entire scutellum black. The breast is almost always wholly yellow, but a few examples have been observed with a black spot on the breast. The upper surface of the metathorax is almost always entirely black, and very rarely having yellow spots on the sides. The abdomen varies much in colour, in the extent of the black marking, which forms a shining spot in the centre. The first segment is yellow, with or without a very small central triangular spot; the second is either yellow, with a similar little triangular spot, or black with yellow margins; the four following are almost always black in the centre and yellow at the sides, the yellow being divided from the black by diverging notched lines. The seventh segment has generally a small triangular mark in the centre; the remaining segments are yellow, which colour is also that of the under side of the abdomen and of the legs, with the exception of some small spots on the coxæ and femora. It only remains to add that the extremities of the tibiæ and of the joints of the tarsi are darker than the ground colour, and that the wings are hyaline, but reddish towards the apex. (See fig. 6). Hartig records as a distinguishing characteristic of this species that the extremities of the under wings are blackish; I do not find this to be the rule with specimens taken in this country; on the contrary, it seldom occurs here.

Both Klug and Hartig have given themselves the trouble of describing all the varieties in coloration which they have observed in the female of this species, to the number of fourteen or fifteen. We shall, however, not follow them in this.

The saw of the female consists, as in the other tree-wasps, of two equal parts, which, when applied to each other, are pointed and more or less curved. They have nine oblique rows of teeth, and on the upper surface are furnished with eight horizontally projecting serratures. The ovipositor, which opens only at the extremity, is transversely ribbed, and has some little knobs on the under side.

This sawfly occupies a conspicuous place among injurious insects. It is the only one of this family which, although not gregarious, has proved singularly destructive. In our country it has made itself known by its ravages, more especially at Driebergen, Zeist, Epe, Apeldoorn, Eibergen, Groesbeck, Barneveld, Brummen, Voorst, Gorssel, Vorden, Laren, Lochem and Ruurlo. It is not possible to estimate with any exactitude the amount of injury caused by this insect in any given year, as our foresters and keepers have so little knowledge of Entomology, or, rather, see so little difference in the various species of vermin, as they call them, that no reliance can be placed on their observations in these matters. There has been some talk of a commission *ad hoc*; but this, like so many projects of a kindred nature, has been laid aside. The injury is indeed felt, but little noticed, and the means of preventing such devastations are, it appears, left to chance, or are expected to come by inspiration.

There is one fact which may tend to make the attack of this insect less injurious than it otherwise would be; that is, that the larvæ much prefer sickly to healthy and well-developed trees, or, what comes to the same thing, the female lays her eggs by preference on diseased pine trees. Whenever they have occurred in such numbers that both sickly and healthy trees have been alike attacked it has been remarked that the southern and western sides of the forest were the first to be eaten bare, and had thus undoubtedly harboured the greatest number of larvæ.

In Germany the devastations of this insect have been known for the last seventy years.

In 1781 they appeared in such great numbers in Pomerania that an average of three hundred cocoons were found on each square Rhineland rood. In the following year they spread themselves into Mark-Brandenburg. There they remained in moderate numbers till 1818, but in 1819 and 1820 they suddenly spread over the greater part of Franconia and Saxony, causing immense injury. In 1834 their numbers again increased to an incredible extent in the neighbourhood of the Elbe. This is not the place to recount the means that have been taken to restrain their ravages, sometimes with and oftentimes without any good result. We refer the reader who may wish to know what has been done in the matter to the special works on the subject, and particularly to Ratzeburg, 'Die Forst Insekten oder Abbildung und

Beschreibung der in den Wäldern Preussens und der Nachbarstaaten als schädlich oder nützlich bekannt gewordenen Insekten,' Berlin, 1839.

It remains, in order to complete the history of our larva, to notice its insect enemies, and more especially its parasites. Of these we have ourselves only observed among the Hymenoptera, Tryphon aulicus and T. variabilis, Campoplex argentatus and Eulophus Lophyrorum, whilst among the Diptera we are only able to name Tachina bimaculata as having appeared from the cocoons of our insect. Hartig gives in addition to these, Cryptus leucosticticus, C. flavilabris, Phrygadeuon Pteronorum, P. pugnax. Mesochorus Laricis, Campoplex retectus, Tryphon Lophyrorum, T. Tenthredinum, T. hæmorrhoicus, T. calcator, Exenterus marginatorius, E. oriolus, E. adspersus, Metopius scobriculatus, and Torymus obsoletus; and of Diptera, besides those mentioned, Tachina gilva and Musca stabulans.

We pass by in silence the notices by Müller in the work above referred to, as the determination appears to us to be too uncertain; but Ratzeburg, in his Wirths-System, mentions, in addition to the Hymenoptera above named, Campoplex carbonarius, Cryptus incertus, C. leucomerus, C. nubeculatus, C. punctatus, Hemiteles areator, H. crassiceps, Mesochorus areolaris, M. scutellatus, Ophion merdarius, Pezomachus cursitans, Pimpla rufata, Tryphon impressus, T. leucosticticus, T. lucidulus, T. Rennenkampffii, T. scutulatus, T. triangulatorius, Pteromalus lugens and P. subfumatus. Of all these Phrygadeuon Pteronorum is the most frequent parasite. Some of the above Ichneumons are parasites on parasites.

Coccus of the Rose.—When hunting on a north wall for large garden spiders I could not but notice a Coccus in great abundance on the older stems of a rose bush, both the male and female insects being visible to the naked eye. For many reasons I for some time believed this to be a species entirely different from that on the orange. The external appearance of all the shields was very different, and when these were turned over the females were so much larger at the head as to be quite different in shape, and of a much darker colour. The eggs, also of a darker colour, were laid in a more or less circular position, and most of the males contained a fly entirely different from that I had previously described. But these were the only differences, and ultimately, after a very careful examination, I traced both males and females, the former more especially, through exactly the same metamorphoses as I have described in my former paper. The small fly I have alluded to as being present in some of the male shields, and, as I found afterwards, in those of the female also, is a species of ichneumon, but its presence alters the external character of the Coccus very little, a slight enlargement in the males only being visible. Beneath the shields there are, however, considerable differences; in the female Coccus the mere fact of a fly being developed is sufficient to indicate an unnatural state, and whereas the male Coccus, when in its pupa state, undergoes considerable changes in its form, the smooth, hard shell in which the ichneumon-fly is developed is invariably uniform. This shell is left behind when the imago escapes, in the male Coccus one or other extremity being removed, but in the female a clean round hole is made through both shell and shield. From examination of some skins of Aphides, from which the ichneumon flies have escaped, I believe that in making the hole this portion of the shield is not destroyed, but a piece is cut out which has very much the appearance of the cover of a "man-hole" to a boiler. The external features of the ichneumon are also of a much higher class than those of the Coccus. The head is perfect in all its parts; there are four wings; the eyes are compound; the extremity of each leg is provided with a beautiful trumpet-shaped sucker, and the ovipositor is capable of being protruded or otherwise. To sum up these few and very short remarks, I venture to repeat the two facts which I consider of most interest,—*first*, that the male of this Coccus may, under some circumstances, be detected in our own gardens; *second*, that the same species may differ very considerably, more especially on the exterior of the shield, according to the climate, its position, or the nature of its food.—*Richard Beck, in 'Quarterly Journal of Microscopical Science.'*

Notes on the Entomology of the Isle of Man.

By the Rev. HUGH A. STOWELL, M.A.

THE Isle of Man has certainly hitherto had scant measure of justice done to its Natural History. Edward Forbes catalogued its Mollusca, and he and others have contributed a paper or two on its Flora; but with these two exceptions, and a few scattered references in the works of Yarrell, the page is still blank. Turning to the 'Zoologist,' that storehouse of local Natural-History lore, we find that four brief notices, not occupying more than half a page collectively,—two of them ornithological, by Captain Hadfield, a third recording a large flight of Vanessa Urticæ on Christmas Eve, and the fourth noting the occurrence of a dark variety of Hydroporus 12-pustulatus, by the Rev. Hamlet Clark,—are the sole contributions towards its Fauna which the eighteen volumes of our familiar friend contain. Stephens' 'Manual' just recognises its existence by noting it as a locality for Carabus granulatus and the ruficeps var. of Harpalus fulvipes, both of which still abound here. Mr. Stainton could glean no item of intelligence about its Lepidopterous productions for *his* 'Manual.' No wonder then that he bestows this piece of advice upon a correspondent, "The island has been very little worked entomologically, but if you keep your eyes open you may do something towards it yourself."—(Ent. W. Int. i. 50). How far "S. R. M," the individual therein immediately addressed, may have profited by the editorial counsel I know not, for since my coming hither it has not been my good fortune to see net entomological plied other than my own. Of nets piscatorial of course there are *quantum sufficit* and a few over, at least so complain one's olfactory nerves now and then. Yet surely the island is not without a peculiar interest, arising from its central position between England, Wales, Scotland and Ireland; and as a *terra incognita* in the heart of the British seas, easily accessible and of late years much visited, it is rather surprising that it should have been quite overlooked by such indefatigable explorers as Dr. Power, Mr. Wollaston and Mr. Clark. I include Mr. Clark because I am sure that he can only have paid it a flying visit if he found nothing more remarkable than the occurrence of Hydroporus 12-pustulatus to record concerning its Coleoptera.

It is only of this immediate neighbourhood that I can speak with any confidence; for be it remembered the Isle of Man—"*the* Island," as we pretentiously style it—is rather larger than Lundy, the Wollaston-explored, and the Scilly Isles of Holiman note. Nevertheless in soil, geological formation and local features this district will represent at least half the island, with a consequent probability of no great variation in the insect fauna of that half. The sandy level of the North, with its "curraghs" or bog-lands, from which the sea has retired at a very recent date geologically speaking,—the old red sandstone of the Western Coast,—and the limestone district in the South,—each of these has probably its own special denizens which will find no record here. Let me then, as briefly as may be, glance at the peculiar features of this locality. The soil is light, gravelly and generally shallow, resting upon schistose rocks, which rise rapidly from the cliffs of the coast to a height of 1000—1200 feet, over which towers the summit of Nortto Barrule, 1900 feet. Of level land there is none. Cultivation reaches an average height of 850 feet; beyond this all the land is unenclosed moor. Glens and ravines varying much in depth and extent plough up table land and hillside in all directions, the beds of as many pretty rivulets, and, where not cloven abruptly through the rock, their lower slopes are rendered swampy by the constant exudation of the water which has fallen on the higher land and been repelled by the underlying rock. Insignificant brooks and shallow puddles on the moors, where the surface has been peeled for fuel, are our only waters, saving always the sublime presence ever with us of the great deep.

Of trees we can boast very few; the ash alone seems indigenous here; the plantations, chiefly of larch and Scotch fir, which clothe the glen sides here and there are all of recent date. The rank herbage and glowing masses of honied flowers that overrun the sunny banks and wood-glades of the mainland, especially in the South, are wanting here. The primrose in spring, the foxglove in summer, the heather in autumn, and the bonnie golden gorse all the year round, are the only flowers sufficiently massed to make much of a show. Hedges are supplanted by banks, of which more elsewhere. It is evident then that the Hydradephaga, Xylophagi, and those families of Coleoptera which especially affect the society of "lush floral beauties," the Longicornes for example, will be poorly represented in such a district, and the same local conditions are of course even more unfavourable to Lepidopterous life than to Coleopterous.

The Macro-Lepidoptera hitherto observed here amount to no more than 146 species, thus distributed:—

Diurni . . .	12	Noctuæ . . .	53
Nocturni (*Guen.*) . .	15	Deltoides (*Latr.*) . .	2
Geometræ . .	42	Pyralides	9
Pseudo-Bombyces (*Guen.*)	2	Crambites . . .	11

Many common and widely distributed species appear to be entirely absent. For this and other reasons, at which I have already hinted, a complete catalogue of our Entomological Fauna would be very interesting were it attainable. In the absence of this, owing to the want of more complete observation, we must be content with enumerating the few species that are in any degree noteworthy, distinguishing those that occur in some plenty with an asterisk, and adding a note where it may seem desirable.

Diurni. Satyrus Semele.*

Nocturni. Macroglossa Stellatarum, Acherontia Atropos, Setina irrorella, Nudaria mundana,* Arctia fuliginosa,* Bombyx Rubi.*

Geometræ. Boarmia cinctaria, Pseudoterpna cytisaria,* Fidonia atomaria,* Gnophos obscurata,* Larentia cæsiata, L. salicata, Emmelesia albulata,* Eupithecia subfulvata (*Haw.*), E. nanata, E. satyrata, E. absinthiata,* E. pumilata,* Thera firmata, Cidaria miata, C. populata, Eubolia mensuraria,* E. palumbaria,* Anaitis plagiata.*

Noctuæ. Leucania conigera,* Hydræcia nictitans, H. micacea,* Axylia putris, Luperina testacea,* Mamestra furva, Miana literosa,* Agrotis valligera, A. nigricans, A. corticea,* A. porphyrea,* Noctua brunnea, N. bella (*Bork.*), Rubi (*View.*), N. neglecta, Xanthia Silago, X. Cerago, Polia Chi, Epunda nigra, Hadena Chenopodii, Xylina petrificata, Heliothis marginata, Anarta Myrtilli, Plusia pulchrina, Stilbia anomala.*

Deltoides. Hypenodes costæstrigalis.

Pyralites. Pyrausta purpuralis, Botys fuscalis,* Scopula etialis,* S. ferrugalis.

Crambites. Crambus margaritellus, C. perlellus, C. Warringtonellus, C. geniculeus,* Aphomia sociella.*

Bombyx Rubi. Of thirty-six larvæ of this species collected on the Cliffs on the 26th of September it may be worth noting that eleven were feeding on Lotus corniculatus, eight on Calluna vulgaris, five on Trifolium pratense, four on Erica cinerea, four on Rubus cæsius, three on Viola canina, and two on Thymus Serpyllum. In confinement, however, they all appear to prefer bramble leaves to any other food. The painful irritation of the skin caused by handling them did not entirely subside till the fifteenth day. The only other larva from which I have experienced the same unpleasant infliction in any marked degree is that of Liparis chrysorrhœa.

Boarmia cinctaria. This species must be double-brooded here. Three young larvæ taken in June, 1859, fed up fast upon Aira canescens, and appeared in the perfect state in the middle of August. The larvæ of B. repandata, which abound here, feed upon various species of Rumex. "Larva living on trees."—(Staint. Man. ii. 25).

Gnophos obscurata. A form of this insect intermediate between the true obscurata and the var. pullata is not uncommon at the foot of the cliffs, south of Cornah Harbour. It flies madly over the huge fallen masses of rock in the hot sunshine, and as soon as the sky is overcast disappears and lies so close that it is almost impossible to put it up. Hence its capture is by no means easy.

Eupithecia pumilata. This pretty little insect is by no means scarce. But on what plant does the larva feed? Clematis and Convolvulus are both absent from our flora hereabouts; so, too, is the common Anthriscus sylvestris, upon which Mr. Crewe reared it. The only Umbellifer growing in any plenty here is the usually rare Carum verticillatum, and upon this I cannot find it.

Anaitis plagiata. In the warm cozy Kentish woods, where I first met with this graceful species in plenty, Hypericum perforatum and H. hirsutum were the sole representatives of its favourite order. Here on our wild storm-beaten cliffs, where it is equally abundant, they are replaced by H. pulchrum and H. humifusum. In both localities it occurs in company with its Coleopterous messmate Chrysomela fucata (Hyperici).

Miana literosa. This may be added to the list of occasional day-fliers.

Heliothis marginata. A single larva taken May 29, 1859, upon Geranium molle, in the middle of a clover field, and fed up on that plant. No Ononis, I am pretty sure, within four miles. Not met with either as larva or imago since. Can this be in any way connected with the "in-seed-importation" doctrine?

Stilbia anomala. This curious insect has only occurred to me at light. The same remark will also apply to Aphomia sociella.

Pyrausta purpuralis. An example of this species came to light about midnight, July 22. I had supposed the genus to be exclusively day-fliers.

I may remark, before taking leave of the Lepidoptera, that the Noctuæ here do not seem to understand sugar. It attracts literally nothing but a few Depressaria and hosts of earwigs. Flowers, on the other hand, especially those of the "cushag" (*Anglice* ragwort), the potent attractions of which are fully appreciated by the practical entomologists of the Lancashire coast, yield a tolerable harvest, though it chiefly consists of the commonest ground-feeding species.

Of the Coleoptera of the Island I can fortunately report better things. The number of species I have met with (406) is considerable, if the fact be taken into account that, with but half a dozen exceptions, they have all occurred within two miles of the house from which I write; and amongst them will be found several very local species and a few of great rarity.

Of the 406 species the thirteen great clans claim respectively the following proportions:—

Geodephaga . . .	71	Heteromera . . .	5
Hydradephaga . . .	8	Rhynchophora . .	77
Brachelytra . . .	94	Xylophagi . .	0
Necrophaga . . .	58	Longicornes . .	0
Lamellicornes . .	18	Eupoda . . .	33
Sternoxi	11	Pseudotrimera . .	18
Malacodermi . . .	13		

It will be observed how remarkably their distribution bears out my previous remarks on the local conditions under which they exist.

The following list will be found rather more select in quality than that of our Lepidoptera, but at the same time more full in quantity, an enlargement which it is hoped will not be blamed by those who remember, how little, comparatively speaking, is known of the distribution, haunts, habits, &c., of British Coleoptera. The terms "by raking" and "in moss, &c.," will be found explained elsewhere.

Dromius fasciatus. Abundant, by raking; also sweeping heather. February—November.

Lebia cyanocephala. One example by raking. Head black, with a slight violet tinge. Thorax pale orange-red. Elytra brassy violet. Legs dark pitchy, except the base of the femora, which are red. March 26, 1861. Is not this very far North for the occurrence of this species?

Clivina collaris. Rare; under stones in moist places. April, September.

Nebria Gyllenhalii. Occasional; under stones, 800 feet and upwards. March—June.

Carabus arvensis. Local and scarce. On Craig-na-mult, 900—1000 feet, in heaps of stones. May. One specimen, black, with a very slight brassy reflection in certain lights.

Carabus nitens. Very local. Swampy ground near the top of Snaefell, 1900—2000 feet. May, June.

Anchomenus micans. Occasional. Wet meadows. March—June.

Pterostichus minor. Locally abundant; in moss, &c. February—April.

Amara bifrons. Rare; under stones. April.

A. consularis. Occasional; under stones and rubbish. March—June.

A. aulica. Frequent; under stones. March—June.

Agabus fontinalis. One example only. May.

Myrmedonia limbata. Rare; in nests of Formica fusca. May.

Eucephalus complicans. Occasional; in moss, &c., and sweeping meadows. March—September.

Quedius maurorufus. Occasional; in moss, &c. March, April.

Lathrobium terminatum. Frequent; in moss, &c. February—April.

Cryptobium fracticorne. Frequent; in moss, &c. February—April.

Evesthetus scaber, E. læviusculus, E. ruficapillus. In moss, &c. February—April, and more sparingly in autumn. I am indebted to the kindness of Dr. Power and my friend Mr. Reading for the determination of these species. E. læviusculus has not, I believe, been taken anywhere else in Great Britain since its first discovery at Holyhead, by Mr. Wollaston.

Olophrum piceum. Frequent; in moss, &c. March, April, September.

Philorinum humile. Frequent; on Ulex. April—June.

Omalium Salicis. Occasional; on blossoms of cherry trees. May.

Pseudopsis sulcatus. One specimen in garden rubbish. September.

Monotoma longicollis. In garden rubbish, with M. picipes, but far scarcer. September, October.

Cytilus varius. Occasional; in moss, &c., and sweeping meadows. March—June.

Simplocaria semistriata. Rare; under stones on grassy banks. May—July.

Scydmænus scutellaris. Rare; in moss, &c. April.

S. hirticollis. Frequent, but local; in moss, &c. . March, April.

Hugh A. Stowell.

(To be continued).

Proceedings of Societies.

Northern Entomological Society.

December 21, 1861.—The meeting took place at the residence of James Linton, Esq., 6, Trafford Mount, Old Trafford, Manchester. C. S. Gregson, Esq., President, in the chair.

Elections.

The President called attention to the advisability of electing his successor at the present meeting, rather than to elect him at the next meeting, when, whoever the duty fell upon, he could scarcely be expected to be in a position to deliver an address at a moment's notice.

The question was discussed, put and carried without a dissentient.

Nicholas Cooke, Esq., was elected President, and G. H. Wilkinson, Esq., was re-elected Secretary.

The Rev. Joseph Greene, Cubley Rectory, Derbyshire, was elected a Member.

Photography applicable to Entomology.

Mr. Greening introduced the subject of photography as applicable to entomological purposes, illustrating his remarks by exhibiting a photograph of a variety of Abraxas grossulariata from the President's collection, executed by Helsby & Co., Church Street, Liverpool.

Mr. Sidebotham explained how, by the use of coloured glass before the lens, the colour of the insect might be neutralized, as in the case of yellow a light blue glass would give green, which colour enabled the photographer to work successfully.

The President explained how, with a half-plate lens, he had succeeded in obtaining the natural size negative of the insect before the meeting. After sundry attempts which all produced reduced figures of the insect, he determined to try what a much greater elongation of the camera would do, and immediately made a long box without ends, fixing the lens end of the camera in one end of it, and drawing the back part out; he got a full-sized figure without further trouble.

Mr. Sidebotham called the attention of the meeting to a series of carefully executed diagrams on the table of the plumules and scales of Pieridæ, made by himself to illustrate a paper by his friend Mr. Watson, and observed that in no case had they found any plumules upon female specimens.

An interesting conversation ensued, in which Mr. Sidebotham gave much valuable information.

The President distributed a number of copies of his "Coleoptera of the District around Liverpool. Section I. Geodephaga. 1861."

Exhibitions.

Mr. Miller exhibited two boxes of Lepidoptera, containing many interesting species, including two fine Acidalia obsoletaria, and some fine varieties, including Hepialus, *var.* carnus, *Steph.*, and a fine variety of Cymatophora flavicornis.

Mr. Chappell exhibited a box of Lepidoptera, in which was the pupa-case of Chortobius Davus, two fine varieties of Polyommatus Phlæas, and a fine pair of N. Bondii, a black variety of Hybernia leucophearia, and a perfect hermaphrodite H. progemmaria having the male wing and female antennæ on the same side and *vice versâ.* He also exhibited a box of rare Coleoptera, including A. Ericeti, Ptenidium lævigatum, and a Pterostichus variety?

The Rev. H. A. Stowell sent a box of Coleoptera for distribution at the meeting, containing Dromius fasciatus, Omius sulcifrons, Mantura Chrysanthemi, &c.

Mr. Greening exhibited a box, in which were a series of E. virgaureata, bred from the seed-heads of Lychnis dioica, and a new species allied to Eupithecia absinthiata, but perfectly distinct. Mr. Johnson also sent this species to be identified.

Mr. Kenderdine exhibited a box, in which was Eupithecia denotata, also E. virgaureata, &c., from Exeter.

Mr. Linton exhibited a box of Lepidoptera, as a sample of the specimens he had received from Mr. Rogers, Freshwater, Isle of Wight; they were generally fine and well set: Agrotis lunigera and A. obelisca, very fine; Aporophila australis, small; Heliophobus hispida, light; Epunda viminalis, darker than southern specimens usually are. He also exhibited a fine series of C. pinguinella, taken by himself in Regent's Park. He also distributed a number of Sesia Cynipiformis, &c., amongst the members.

Mr. Mawson, of Cockermouth, sent a box, in which, amongst other species, all fine, were Lobophora viretata, from Keswick, Oporabia filigrammaria, Agrotis Ripæ, Xylina petrificata (dark), Coremia ferrugata, Notodonta Carmelita (very large and well marked), and a variety of Cidaria silaceata, with the band uninterrupted.

Mr. Hodgkinson exhibited a box, in which were Acronycta Alni, Leucania putrescens, and a recent specimen of Lycæna Acis, from Ipswich, taken amongst L. Ægon, in 1861, and a box in which were fine series of Stigmonota lunulana, C. pupillana, Asychna terminella and Elachista trapeziella, from Mr. Wilkinson, of Scarborough.

Mr. Pugh, of Preston, exhibited a pair of Dicranura bicuspis, fine and beautiful, from his own cabinet.

Mr. Sidebotham exhibited a box, in which was a magnificent variety of Chelonia villica, having dark suffused wings, which was much admired, the President calling attention to one almost like it exhibited by Mr. Reading, of Plymouth, three or four years ago.

Mr. Sidebotham also exhibited a box containing foreign specimens of Dianthæcia compta and D. conspersa, and opposite to them British specimens, one of which (received from Mr. H. J. Harding, of Deal), having the white band continued through the wing, presented the exact appearance of the foreign D. compta.

Mr. Hodgkinson distributed Noctua neglecta, Phoxopteryx uncana, &c., amongst the members who wanted them. He then exhibited Schœnobius mucronellus, recently captured in the North of England.

Mr. Sayer, of London, sent to the President, for his opinion as to their specific difference, a series of an Elachista he had bred from Poa aquatica, mining differently to E. Poæ. The President said he should prefer seeing the mine before giving an opinion, as the perfect insect is very like E. Poæ.

Mr. Thomas, of Sheffield, sent a Eupithecia to be named at the meeting: it proved to be a variety of E. subumbrata.

The President read the following:—

Description of a Coleophora new to Science.

COLEOPHORA IDÆELLA, *Gregson.*

"The whole insect silvery gray in the male, and grayish ochreous in the female. Wings very narrow; expanse 4 to 5 lines. Closely allied to C. viminetella and C. vitisella, but differs from them in its case, which is when young cylindrical; afterwards the mouth is ringed, as in the case of C. vitisella; then a small raised lump on the shoulder; then a decided triangular hump, giving the case much the shape of a Notodonta larva.

"I first observed this case on leaves of Vaccinium Vitis-Idæa received from Scotland: it was then young and dead, and I have ever since kept my eyes open for it when in localities where its food-plant grows; but we are indebted to one of our members for first finding it in Lancashire, and first breeding it. The untiring patience of Mr. Hague here meets its reward, he having now bred it several times. I may say we spent many cold hours at the Brushes together in April hunting for it before it put in an appearance there, and now that it is found it seems very scarce. Its case is nearly allied to that of Coleophora viminitella, and the insect should be located between that species and C. vitisella."

The President also read the following:—

Notes on Variety Breeding.

"After years of constant study of the habits and food of insects, I determined to ascertain if a change of food would give a change of colouring and marking to species liable to sport, and during the last ten years I have been quietly pursuing my experiments, unknown to and unassisted by any one, and the results of my experience go to prove most unquestionably that many species may be cultivated into varieties, some of them hitherto not often thought liable to vary; for instance, Pygæra Bucephala fed upon sycamore is much finer and much darker than when fed upon any other food I know, though it is well known this species never is found on that tree in its natural state. Again, Xylophasia polyodon fed upon heather is always a dark insect, sometimes perfectly black; Hadena adusta fed upon heath is also much darker than when fed upon any other plant; Acronycta Menyanthidis fed on sallow, on the contrary, often produces Curtis's variety, A. Salicis, whilst fed on heath it produces the light specimens of our mosses. Again, Cidaria populata fed on Vaccinium Myrtillus, is always light, whilst when fed upon V. Vitis-Idæa it is always darker, sometimes dark brown without any markings; Hybernia defoliaria fed upon birch gives beautifully marked specimens, whilst those fed on elm are but poor dull coloured forms, almost without markings; Eupithecia venosata fed upon inflated catchfly is almost white, whilst those fed on the shore catchfly are much larger and almost lead-colour; Noctua festiva fed upon thorn is a rich red insect, well marked,—fed upon grasses it is light yellowish, and though it attains its full size, yet it is rarely well marked; and N. triangulum fed on thorn is perhaps one of the richest coloured Noctuæ we have,—dark, and its markings well defined, whilst fed on low plants it is a light insect. Eupithecia assimilata fed on wild hop is finer than when fed on black currant. Abraxas Grossulariata fed upon red currant produces a light brood, fed upon blackthorn they are darker; but fed upon bullace, or wild plum, they are darker still, and the white is sometimes turned into yellow. But what will perhaps interest you most to know, and undoubtedly what I know best and have oftenest tried and succeeded in, is that Chelonia Caja fed upon Petasites vulgaris, or upon the common coltsfoot, will produce darker specimens than when fed upon any other plant I know, and the chances are that when fed upon this food one or more will prove extraordinarily dark, but there is a singularity in the fact that the dark specimens so bred rarely expand their wings: the same remarks apply to the dark specimens of the 'pepper moth,' though we know that one Bolton breeder did succeed one year in getting a considerable number of dark ones out perfect; he never stated on what he fed them, but I expect it was on coltsfoot.

"In bringing this paper before the meeting, I wish it to be understood that I have succeeded in breeding varieties as stated, but not that these are the only species I have practised upon or succeeded with. A sight of my varieties will best show that, but having derived great pleasure from my successful experiments I wish others to follow them up, and so share with me the pleasure."

Mr. Gregson illustrated the foregoing paper by a box containing specimens of varieties of the following species, all recently added to his collection: — Ephyra orbicularia, Celæna Haworthii, Tæniocampa gothica, Acronycta Menyanthidis, Orthosia suspecta, Noctua triangulum, N. festiva, Cidaria immanata, Abraxas Grossulariata, Liparis auriflua, Chelonia Caja, Hybernia defoliaria, &c.

An interesting discussion on the paper ensued.

A vote of thanks to the retiring President brought the meeting to a close.—*G. H. W.*

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The Report of the Entomological Society of London arrived too late for insertion. At the Anniversary Meeting last evening Mr. F. Smith was elected President, Mr. S. Stevens, Treasurer, Messrs. E. Shepherd and J. W. Dunning, Secretaries, and Messrs. Mitford, Pascoe, Smith and Wallace new members of Council. A full report of the three consecutive meetings will appear in the February number of the 'Zoologist.

Copies of March Number of 'Zoologist' wanted.—I shall be happy to purchase the March number for one shilling and to pay postage, or to exchange a bound copy of 'Birdsnesting' for a copy of either the March or April number of 'Zoologist.' An unusually large sale of these two numbers (226 and 227) is attributed to their containing the said paper on birdsnesting.—*Edward Newman.*

Just published, in foolscap octavo, price 5s.

RECORDS OF ANIMAL SAGACITY AND CHARACTER: with a Preface on the Future Existence of the Animal Creation. By the Rev. F. O. MORRIS, B.A., Rector of Nunburnholme.

London: Longman, Green, Longman and Roberts.

Printed by E. Newman, 9, Devonshire Street, Bishopsgate Street, N.E.